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# In the eye of a leader: eye-directed gazing shapes perceptions of leaders' charisma

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## Abstract

Charismatic leadership improves organizational performance. Charisma itself can be defined as a repertoire of behaviors designed to communicate, however its constituents remain elusive. We hypothesized leaders' eye-directed gaze to be one such behavior, and therefore linked to their charisma. Using eye-tracking, we monitored gaze during a simulated leadership scenario, in which subjects attempted to influence followers towards a common goal. In two studies, we found subjects' impressions of their own charisma to predict the frequency and duration of gaze directed at their followers' eyes. In addition, longer and more frequent eye-directed gazing led leaders to appear both more charismatic and prototypical of their position in the eyes of their audience. Our findings provide first evidence that leaders' gazing towards the eyes of an audience is linked to their charisma. By investigating a leader's charisma through the lens of the signaling approach, we offer insight into the behaviors constituting charismatic leadership.

## Keywords

Charismatic Leadership | Charisma | Eye Movements | Visual Attention | Communication

19 **Highlights**

- 20       • Leaders' charisma is composed of a repertoire of communicative behaviors
- 21       • Leaders' gaze behavior was monitored during a simulated leadership scenario
- 22       • Eye-directed gazing is predicted by leaders' impressions of their own charisma
- 23       • Eye-directed gazing shapes observers' perceptions of leaders, increasing ascribed charisma and
- 24       leader prototypicality

## **In the eye of a leader: eye-directed gazing shapes perceptions of leaders' charisma**

Imagine being part of the audience when a remarkable firm launches a new product. Suddenly, the gaze of the charismatic business leader on the stage finds you, and you feel electrified, captured, and connected (Kampe, Frith, & Frith, 2003). The ability to elicit such emotional resonance in followers is the hallmark of charismatic leadership, and to do so, impressive leaders have often been known to employ particularly piercing eyes (Bryman, 1992). Remarkably palpable communication, employing a high number of salient verbal and nonverbal signals, is at the heart of charisma (Antonakis, Bastardo, Jacquart, & Shamir, 2016). Indeed, evidence suggests expressive behavior to indicate actual leadership ability (Grabo, Spisak, & van Vugt, 2017; Reh, Van Quaquebeke, & Giessner, 2017), since it enables an individual to emerge as the leader of a group (Gerpott, Lehmann-Willenbrock, Silvis, & van Vugt, 2018), earn ascriptions of success (Tskhay, Xu, & Rule, 2014), and to influence followership (Antonakis, Fenley, & Liechti, 2011). Recently, preliminary evidence has given rise to the assumption that the same may be true for eye-directed gaze (Clark & Greatbatch, 2011; Tskhay, Zhu, & Rule, 2017).

Surprisingly, these superficial impressions withstand critical examination, as charismatic leadership has been proven to be the most effective way of coordinating followership (Bass, 1985). The outstanding importance of this “new leadership” concept (Antonakis, 2018) for leadership science stems from convincing evidence proving its effectiveness in organizational leadership. A meta-analysis of 76 independent studies shows that charismatic leadership increases organizational effectiveness by improving objective performance on multiple levels, ranging from individuals to the whole organization (Banks et al., 2017). However, conceptions of charisma suffer from the problem of endogeneity, and therefore have recently become the subject of strong criticism (van Knippenberg & Sitkin, 2013). This is the case first and foremost because existing tools almost exclusively assess charisma in terms of its effects, rather than

conceptualizing it through concrete and measurable leadership behaviors (Antonakis et al., 2016; Yukl, 1999). This precludes its use as an exogenous variable in the design of new research, seriously limiting its application and the validity of past results. Hence, despite the obvious importance of charisma, we still lack a clear understanding of the proximal signals that constitute the distal construct of charismatic leadership (Antonakis, Day, & Schyns, 2012; Antonakis et al., 2016). Of late, there has been a clamor to base novel definitions of charisma on the range of behaviors, sent by the leader, and received by followers, that engender it (Antonakis et al., 2016; Grabo, Spisak, & van Vugt, 2017).

In this, our study aims to contribute, addressing the current limitations of empirical conceptualizations of charisma within this under-researched area. To do this, we assess whether eye contact of greater frequency and duration is typical of charismatic leaders. This is what we aim to accomplish in two studies, by mapping leaders' charisma onto an objective, measurable behavior, their gaze directed towards followers' eyes, with the use of eye-tracking technology. The first study investigates whether increased gazing towards the eyes of followers, while trying to influence them in pursuit of a common goal, is predicted by a charismatic personality. The second study aims to replicate our initial findings using established measures of leaders' charisma, and further tests whether eye-directed gazing coincides with the impressions of a leader's charisma as perceived by others. We find that leaders' self-ascribed charisma showed a specific relationship with heightened eye-directed gaze, while related constructs, such as motivation to lead, failed to show any association. Interestingly, when attempting to influence followers towards a common goal, the gaze of participants acting as leaders towards their followers' eyes makes the former appear more charismatic, and further, earns them ascriptions of desirable leader attributes in the eyes of an audience. Our results open a gateway from one of the most salient nonverbal channels of communication, eye-directed gaze, to charismatic leadership. Though these findings illuminate only a section of the signaling process, they contribute to the efforts underway to decode the proximal elements constituting charisma (Antonakis et al., 2012) that allow leaders to motivate their followers with such success (Banks et al., 2017).

## Theoretical background

Influencing followers towards a common objective is the core issue of the leadership process, as it enables the successful coordination of group action (Antonakis & Day, 2018; Grabo et al., 2017; Spisak, O'Brien, Nicholson, & van Vugt, 2015). Therein charisma plays a crucial role, since it represents a "value-based, symbolic and emotion-laden leader signaling" (Antonakis et al., 2016, p. 304) that empowers a leader to influence followers in pursuit of a shared ambition. Such a signaling approach to charisma puts the focus on verbal and nonverbal behaviors (Reh et al., 2017), which, from this perspective, act as reliable cues used by followers to assess an individual's ability to lead effectively (Grabo et al., 2017). And indeed, when it comes to leader emergence, followers' attention is hijacked by such cues, suggesting a heightened sensitivity for signals providing information on who is able to coordinate a group effectively (Gerpott et al., 2018). In particular, nonverbal behavior constitutes a crucial ingredient of successful communication at the workplace (Bonaccio, O'Reilly, O'Sullivan, & Chiocchio, 2016), even more so when leading others (van Knippenberg & van Kleef, 2016). For example, followers pay special attention to facial appearance (Antonakis & Eubanks, 2017) or particularly expressive nonverbal behaviors (Trichas, Schyns, Lord, & Hall, 2017) when developing their impression of a leader. To conclude, the use of an unusually broad selection of signals may produce the aura of charisma surrounding exceptional leaders, and critically, followers are tuned to recognize and integrate such cues when judging who might be most capable, and therefore most likely to emerge and gain acceptance as a leader (Grabo et al., 2017). This might explain why follower's attributions of a leader as charismatic are highly conducive to a leader's influence over that followership (Johnson & Dipboye, 2008), and why charismatic leadership is the most effective form of leading in organizations (Banks et al., 2017; Jacquart & Antonakis, 2015).

Eye-directed gaze is probably the most basic nonverbal component of communication, exhibiting a strong signaling function (Grossmann, 2017; Risko, Richardson, & Kingstone, 2016; Sipošova, Tomasello, & Carpenter, 2018; Wu, Bischof, & Kingstone, 2014). Its function as a signal arises threefold: firstly, it is highly visible and designed to communicate; secondly, it impacts the receiver's impressions; and thirdly,

99 it shapes the latter's behavior. Its high visibility exists because the human eye's morphology specifically  
100 evolved to facilitate social communication. Possessing the most prominent whites of any primate species,  
101 our eyes are horizontally elongated (Kobayashi & Kohshima, 1997), and thereby facilitate accurate location  
102 of where our fellow humans' attention is lying (Emery, 2000). These developments have given eyes another  
103 function beyond the gathering of information, namely highlighting our gaze's direction from moment to  
104 moment, transforming it into a potent social signal (Gobel, Kim, & Richardson, 2015; Khalid, Deska, &  
105 Hugenberg, 2016).

106 Secondly, the mere way we look at others shapes the receiver's personal impressions, and can earn us a  
107 range of ascriptions (e.g. Tskhay et al., 2017), including various attributes desirable in a leader. For  
108 example, people who exhibit increased eye-directed gaze appear to be more powerful (Dovidio & Ellyson,  
109 1982), potent (Brooks, Church, & Fraser, 1986), and dominant (Hall, Coats, & LeBeau, 2005). This  
110 explains why eye contact has been considered in every study employing dramaturgical operationalizations  
111 of charismatic leadership (e.g. Caspi, Bogler, & Tzuman, 2019; Holladay & Coombs, 1994; Johnson &  
112 Dipboye, 2008).

113 Thirdly, gazing can not only shape attributions prototypical of a leader, but also elicits responses from  
114 receivers that support leadership. For example, perceived eye contact arouses pleasant emotions (Hietanen  
115 et al., 2018) and feelings of self-involvement (Conty, George, & Hietanen, 2016), and is simultaneously  
116 capable of promoting cooperation (Bateson, Nettle, & Roberts, 2006), prosocial behavior (Ekström, 2012),  
117 honesty (Nettle, Nott, & Bateson, 2012), and even behavioral synchronization (Prinsen et al., 2017). These  
118 latter effects give rise to the supposition that eye-directed gaze may have ameliorative outcomes for both  
119 sender and receiver, supporting the suggestion that it may act as a signal (Grabo et al., 2017). Some findings  
120 translate directly to the domain of leadership. For instance, the followership of former populist, Italian  
121 prime minister Silvio Berlusconi reflexively followed the gaze of their right-wing leader (Cazzato, Liuzza,  
122 Caprara, Macaluso, & Aglioti, 2015; Liuzza et al., 2011). Interestingly, a leader's fall in popularity is  
123 preceded by a reduction of their gaze's attractive power (Porciello, Liuzza, Minio-Paluello, Caprara, &  
124 Aglioti, 2016).

## The current study

To summarize the above-mentioned findings, eye-directed gaze hijacks attention (e.g. Liuzza et al., 2011), promotes prototypical leader impressions (e.g. Tskhay et al., 2017), elicits approach (e.g. Hietanen et al., 2018) and facilitates cooperation (e.g. Bateson et al., 2006). In other words, eye-directed gazing might support leaders in appealing to and captivating their followership, lending potency to their message of cooperation in the pursuit of a shared vision. However, as opposed to facial appearance (Dietl, Rule, & Blickle, 2018) or emotional expressions (Trichas et al., 2017), research on leadership has so far paid little attention to social gaze behavior. We aim to zoom into the signaling process of leaders' charisma (Antonakis et al., 2016; Grabo et al., 2017) by investigating a core element of signaling, the sending and receiving of a distinct behavior that could shape leaders' charisma, their gaze towards followers eyes (Tskhay et al., 2017). It is therefore suggested that senders, charismatic leaders, employ heightened eye-directed gaze when attempting to influence receivers, their followers. As such we propose, that more charismatic leaders exhibit increased eye-directed gazing, specifically more frequent (count of fixations) and prolonged gaze (duration of fixations) towards the eyes of followers they are attempting to influence. The frequency of fixations is indicative of the orienting component of visual attention, while the duration of fixations indicates attentional engagement (Nummenmaa, Hyönä, & Calvo, 2006). Charismatic individuals might both show prolonged gaze towards the eyes of their counterparts, and regularly reorient towards the eyes once averted, while attempting to captivate them.

**Hypothesis 1.** *The more charisma leaders ascribe to themselves, the more often they gaze towards their followers' eyes while attempting to influence them.*



**Hypothesis 2.** *The more charisma leaders ascribe to themselves, the longer they gaze towards their followers' eyes while attempting to influence them.*

Using the behaviors that make up charisma enables leaders to exert influence over their followership in pursuit of a shared goal (Antonakis et al., 2016). Influencing, in turn, requires that the leaders' behavior is received and acted upon by followers (Grabo et al., 2017; Spence, 2002). We suggest that followers receive a leader's heightened gaze towards their eyes, as indicated by its ability to increase perceptions of the leader's charisma. More specifically, we propose that leaders who display more frequent (count of fixations) and prolonged eye-directed gazing (duration of fixations), while attempting to influence followers, are perceived as more charismatic by others.

**Hypothesis 3.** *The more often leaders gaze towards followers' eyes, while attempting to influence them, the more charisma is ascribed to them by those followers.*

**Hypothesis 4.** *The longer leaders gaze towards followers' eyes, while attempting to influence them, the more charisma is ascribed to them by those followers.*

To test our predictions, we designed two studies to investigate the hypothesized link between leaders' charisma and the gaze they directed towards followers' eye regions. Across both studies, we assessed charisma of participants placed in a leader role, and examined their gaze behavior while speaking to an audience during an economic game. As influencing followers is one of the core elements of leadership (Antonakis & Day, 2018, p. 6), we simulated a scenario where participants have to take such a role and to show influence behaviors in order to move their audience towards a common goal. This scenario has previously been successfully applied to investigate the effects of the legitimacy of leaders on group outcomes (Brandts, Cooper, & Weber, 2015). By using eye-tracking on participants appointed to a

leadership position, we were able to analyse their gaze fixations towards the eyes of followers throughout their efforts to influence them.

In Study 1 we approach the proposed link between subjects' perceptions of their own charisma and their social gaze behavior (hypothesis 1 and 2). In study 2, we attempt to replicate the results of study 1 and, in doing so, to tie in to the existing research by referring to established measures of leaders' charisma used to assess charismatic leadership (hypothesis 1 and 2). Most importantly, study 2 aims to overcome the limitations of self-report data and captures naïve observers' impressions of the leader's charisma (hypothesis 3 and 4). Thus, we tested whether eye-directed gaze was both sent by participants holding a leadership position and received by naïve observers, a distinction crucial regarding its ability to shape the latter's impressions of a leader's charisma.

## **Study 1**

In study 1, we examined whether the general charisma of participants acting as leaders predicted their gaze directed towards the eye region of followers, and moreover whether it explained variance in eye-directed gaze behavior beyond the Five Factor Model of personality (McCrae & Costa, 2010), thus seeking preliminary support for hypotheses 1 and 2. To capture a leader's general charisma, we relied on a recent, operational conceptualization of charisma for everyday life, designed to extend beyond but still include leadership (Tskhay, Zhu, Zou, & Rule, 2018). This conceives of general charisma as a combination of tangible interindividual differences in influence, i.e. the ability to persuade and guide others, and affability, i.e. the ability to make other people feel comfortable.

## **Methods and design**

We developed a task combining methods of experimental economics (e.g. Brandts et al., 2015) with high precision eye-tracking technology (e.g. Gerpott et al., 2018). Participants, informed that they had been randomly assigned as group leader, were tasked with attempting to influence four followers towards contributing investments (see *Supplementary Information*). Their aim was to maximize the final group payout over four rounds, which was commensurate with course credits. They played an adapted version of the Turnaround Game (Brandts et al., 2015), an economic game designed to cause an inefficient equilibrium. The game revolves around the independent investments of each player, with the final payout dependent on these individual investments. Higher investments increased the final payout, but also their risk of a potential loss, due to the possibility of another participant committing less.

Participants acting as leaders had to give two-minute speeches in each round to influence followers to maximize their investment. This occurred via a simulated live video connection, displaying followers seated in another room, which was established for each of the four rounds. Participants were informed that their face and voice would be transmitted to a screen in front of the followers in real time, while in reality, four videos of confederates had already been pre-recorded and edited to appear as real, live video connections (see *Supplementary Information*).

After each speech, a feedback chart appeared on screen containing the individual investments of the followers. They were pre-defined identically for all the participants acting as leaders, and varied for each of the four rounds. Subsequently, the leader had a thirty second period to prepare the next speech, after which the next video clip started. The simulated live video connection was presented on the screen of the Tobii TX300 eye-tracker which recorded participants' gaze behavior throughout the task. Following the task, participants completed self-rating questionnaires.

## Sample

The initial sample consisted of 83 healthy young adults (61 female; 22 male) that participated voluntarily in the study. Their age ranged from 18 to 31 years,  $M = 21.05$ ,  $SD = 2.15$ . Subjects reported to have normal

or corrected-to-normal visual ability. We controlled whether participants recognized their followers to be confederates or the video connection as being pre-recorded, via self-report. Only three participants met those criteria (male, 20; female, 20; female, 21), and were subsequently removed from analysis. Their data were not considered, resulting in a final sample of 80 (59 female; 21 male), whose age ranged from 18 to 31 years,  $M = 21.07$ ,  $SD = 2.19$ . The study was conducted in line with the guidelines of the Ethics Committee of the University of \_ and participants provided informed consent.

### **Visual stimulus material**

Four videos, each with a runtime of about two and a half minutes, were recorded (1920 x 1080 pixels), portraying four followers sitting on one side of a table, showing attention to the camera. The content was designed specifically to appear as naturalistic and authentic as possible, to give participants the impression of being under observation by live counterparts (see *Supplementary Information*). This was necessitated by recent research, finding that a person's perception of a social presence is the key to inducing that person to use their gaze in the service of social signaling. Lacking such a social presence, the function remains dormant, and gaze remains largely a means of gathering information (e.g. Gobel et al., 2015; see *Supplementary Information*).

### **Charisma**

The General Charisma Inventory (Tskhay et al., 2018) is a psychometrically well proven measure of general charisma, with the two subscales of influence and affability. This measure, based on a popular understanding of charisma, was rigorously developed by querying people as to which traits they employ to describe charismatic individuals, and then analyzing these for the most relevant dimensions (see *Supplementary Information*).

We included the original 10-item version, replicating the two-factor structure of the General Charisma Inventory provided by the authors (see *Supplementary Information*) and calculated Cronbach's  $\alpha$  values to assess the scales' reliability ( $\alpha = .89$  for the influence,  $\alpha = .75$  for the affability subscale, respectively).

### **Five factor model of personality**

The NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, German translation by Borkenau & Ostendorf, 2008) is a well-established 60-item questionnaire based on the Five-Factor Model of personality. Reliabilities for our data were calculated at  $\alpha = .89$  for neuroticism,  $\alpha = .80$  for extraversion,  $\alpha = .74$  for openness,  $\alpha = .76$  for agreeableness, and  $\alpha = .80$  for conscientiousness.

### **Gaze behavior**

A Tobii TX300 binocular near-infrared eye-tracking system (Tobii Technology, Stockholm, Sweden) recorded gaze patterns with a sampling rate of 300 Hz. This system has a precision rate of  $.15^\circ$  and an accuracy rate of  $.40^\circ$  at ideal conditions. Fixations were calculated using the Tobii Fixation Filter. We defined dynamic areas of interest frame by frame for the eye region of each confederate within each video (144 x 80 pixels). Dependent variables were the overall duration of all fixations [s] as well as the total count of fixations, over all video recordings.

### **Results and discussion**

We first calculated Pearson product-moment correlation coefficients to assess the relationship between the count and duration of eye contact, both dimensions of general charisma, and the five factors of personality. Correlations are reported as  $r$  [ $\pm .10$  = small effect;  $\pm .30$  = medium effect;  $\pm .50$  = large effect]. To look

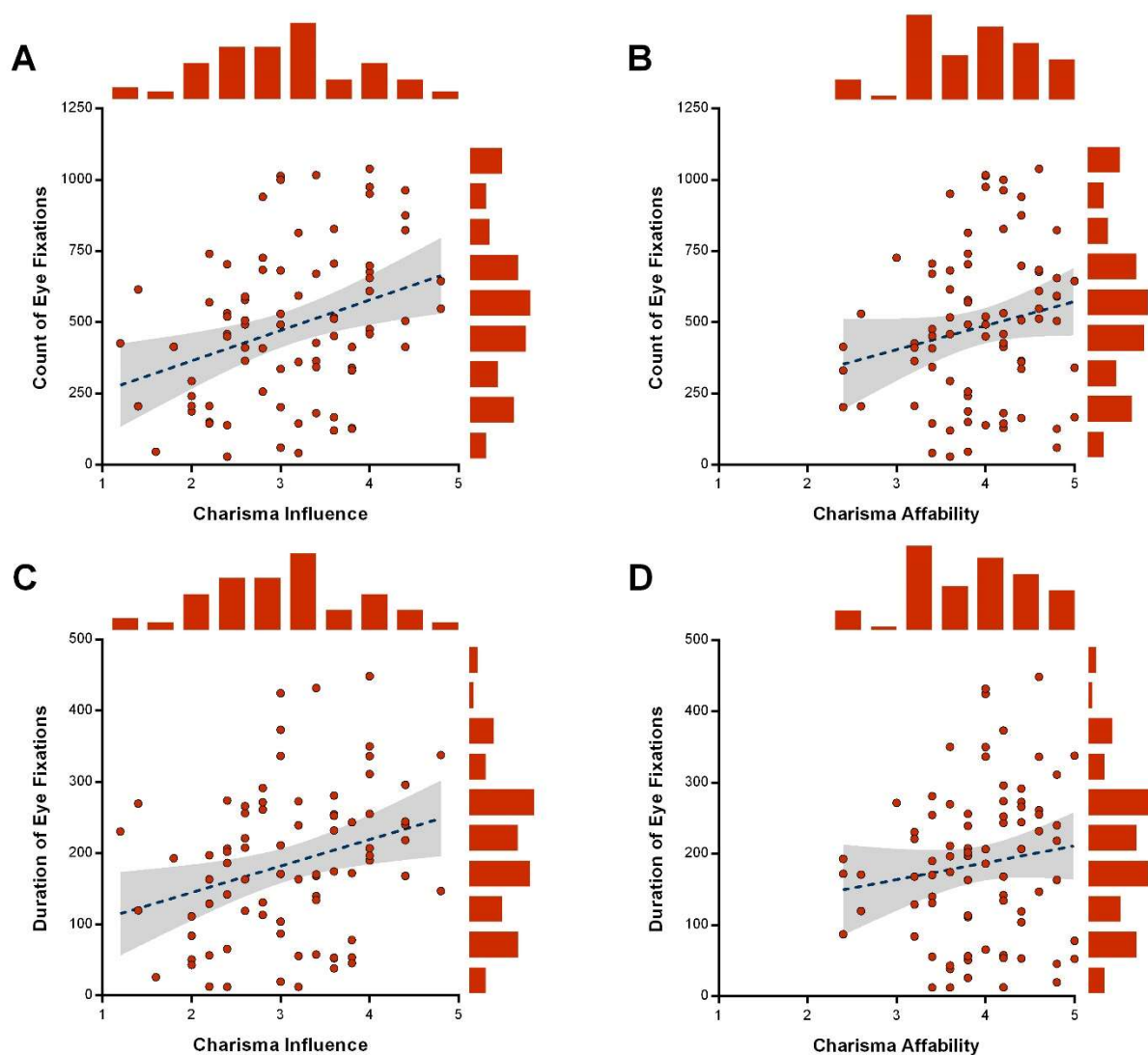
further into these relationships, we then calculated linear regression models. Data analyses were conducted using SPSS (Version 24) <sup>1</sup>.

Correlational analyses revealed the predicted links among variables (see Table 1 for an overview). First, charismatic influence was associated both with the count ( $r = .33, p = .0029$ ) and duration ( $r = .29, p = .0091$ ) of participants' fixations towards eye regions. By contrast, the second dimension of general charisma, affability, was not linked ( $r = .20, p = .0782$  for count;  $r = .14, p = .2125$  for duration). Similarly, we found no association of the count and overall duration of fixations towards eye regions and neuroticism, extraversion, openness, agreeableness or conscientiousness (all  $p$ 's  $> .05$ ; Table 1; Fig. 1).

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Table 1 about here  
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<sup>1</sup> All data are available at the Open Science Framework website, <https://osf.io/bnq32/>.



**Fig. 1.** Correlations are displayed between the count (A, B) and duration (in [s]; C, D) of eye fixations and charisma influence (A, C) and affability (B, D). The unstandardized values ( $N = 80$ ) are displayed with linear regressions and a 95% confidence interval. Histograms on either side of the graphs denote relative frequency distributions.

In a last step, to test whether general charisma explained variance in eye-directed gaze beyond the five-factor model of personality, we computed two-step, ordinary least squares linear regression models. In order to reduce the influence of heteroskedasticity, robust standard errors were calculated using the

heteroskedasticity consistent estimator 3 (HC3; Davidson & MacKinnon, 1993) in the RLM macro for SPSS by Darlington and Hayes (2016). Standardized coefficients are reported. The first model, encompassing only the Big Five dimensions, did not predict the count of fixations towards the eye region ( $\Delta R^2 = .08$ ,  $F(5,74) = 1.34$ ,  $SE = .99$ ,  $p = .2559$ ; see Table 2), and yielded no significant weights for personality traits (all  $p$ 's  $> .05$ ). However, the addition of the two facets of general charisma into a second model ( $\Delta R^2 = .14$ ,  $F(7,72) = 3.47$ ,  $SE = .93$ ,  $p = .0029$ ) increased the explained variance from 8% to 22% and showed effects for charisma influence ( $\beta = .50$ ,  $SE = .15$ ,  $p = .0011$ ) but not for affability ( $\beta = -.07$ ,  $SE = .13$ ,  $p = .9381$ ). Again, this second model showed no significant weights for other Big Five dimensions (all  $p$ 's  $> .05$ ), except for agreeableness ( $\beta = .32$ ,  $SE = .12$ ,  $p = .0122$ ).

The same pattern was found for the duration of eye-directed gaze, with a model ( $\Delta R^2 = .05$ ,  $F(5,74) = .70$ ,  $SE = 1.01$ ,  $p = .6283$ ), containing exclusively the Big Five personality traits, yielding no prediction (all  $p$ 's  $> .05$ ). The explained variance was once more increased through the inclusion of the two dimensions of general charisma ( $\Delta R^2 = .11$ ,  $F(7,72) = 2.30$ ,  $SE = .96$ ,  $p = .0360$ ), with mainly charisma influence ( $\beta = .48$ ,  $SE = .15$ ,  $p = .0019$ ), but not affability ( $\beta = -.06$ ,  $SE = .14$ ,  $p = .6872$ ), again showing predictive power. The other personality traits displayed no effects (all  $p$ 's  $> .05$ ), except for agreeableness ( $\beta = .31$ ,  $SE = .13$ ,  $p = .0195$ ).

Table 2 about here

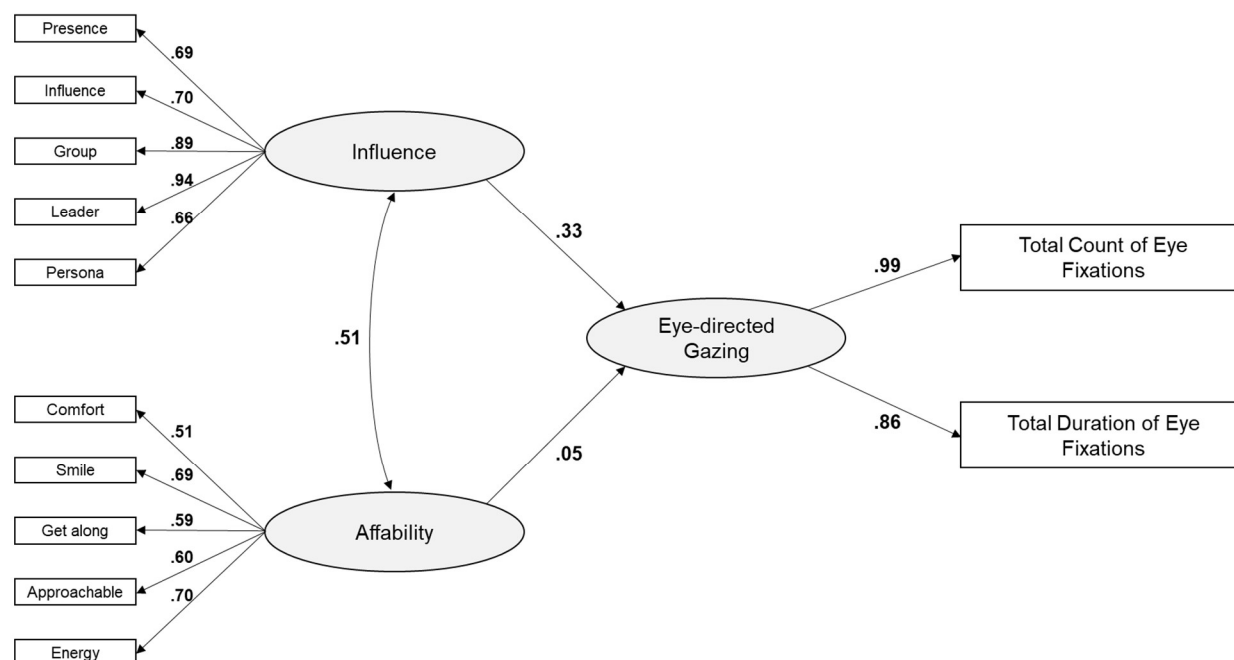
### Post Hoc Analysis: Structural Equation Modelling

Since both the count and duration of fixations are correlated highly ( $r = .85$ ,  $p < .0001$ ), we combined them in a structural equation model, testing whether this new latent variable was predicted by charismatic influence and affability (Fig. 2). Maximum likelihood estimates were calculated using SPSS AMOS



(Version 24.0.0). We calculated several descriptive measures of the overall model fit ( $\chi^2/d.f.$ , sufficient fit  $\leq 3$ ; good fit  $\leq 2$  *SRMR*, sufficient fit  $\leq 0.10$ , good fit  $\leq 0.05$ ) and comparative measures of increased model fit between the proposed and the independence model (*TLI*, sufficient fit  $\geq 0.95$ , good fit  $\geq 0.97$  Browne & Cudeck, 1993; Hu & Bentler, 1999). In order to reduce the influence of heteroskedasticity, bootstrap estimates of standard errors were calculated using 500 bootstrap samples (Arbuckle, 2016; Nevitt & Hancock, 2001; Yung & Bentler, 1996). We report standardized coefficients for the structural equation model.

The observed data show a good fit with the proposed structural model ( $\chi^2_{(51)} = 61.32$ ,  $p = .1527$ ,  $\chi^2/d.f. = 1.20$ ; *SRMR* = .08; *TLI* = .97; Fig. 2). The results also confirmed eye-directed gazing as a latent factor for the count ( $\beta = .99$ ,  $SE = .16$ ,  $p < .0001$ ) and duration ( $\beta = .86$ ,  $SE = .13$ ,  $p < .0001$ ) of eye-directed gaze. Importantly, increases in eye-directed gazing, expressed as more frequent and prolonged eye-directed gaze, can be traced back to the influence dimension of general charisma ( $\beta = .33$ ,  $SE = .14$ ,  $p = .0218$ ), but not to the affability dimension ( $\beta = .05$ ,  $SE = .16$ ,  $p = .7164$ ).



**Fig. 2.** Structural equation model of the two dimensions of general charisma, influence and affability, and the count and duration of eye fixations, explained by the latent factor eye-directed gazing. Standardized coefficient estimates are displayed.  $N = 80$ .

These results provide preliminary evidence favoring the hypothesized link between leaders' charismatic influence and both the count (hypothesis 1) and duration (hypothesis 2) of gaze fixations towards followers' eyes, beyond the established five factors of personality. Increased eye-directed gaze might characterize those in particular who tend to charismatically influence others, but not necessarily those who prefer to charismatically socialize with others.

A limitation of the study is its reliance on self-reported data, an issue exacerbated by the endogenous conceptualization of the items used to measure charisma (Antonakis et al., 2016; see *Supplementary Information*). The influence dimension, for example, measures whether a person exudes a magnetic aura or impressive presence, rather than concrete behaviors. It remains to remediate these issues, which is our aim in study 2. While study 1 linked participants' social gazing with impressions of their own general charisma, study 2 assessed whether eye-directed gaze behavior shaped followers' impressions of charisma (Grabo et al., 2017). Furthermore, while study 1 employed a conceptualization of general charisma, study 2, aiming to capture leaders' charisma, employed measures of charismatic leadership.

## Study 2

Because of the limitations of study 1, therefore, this second study proceeded to test these results in a trial by fire. In a first step, we sought to replicate our previous results with established measures of charismatic leadership, shoring up evidence for our first and second hypothesis. However, our examination of charismatic leadership was carried out through the lens of the signaling approach, which focuses on behaviors both sent and received (Antonakis et al., 2016; Spence, 2002). Therefore, a crucial second step

was investigating whether eye-directed gaze was received by followers, and thereby impacted their impressions of a leader's charisma (hypotheses 3 and 4).

## **Methods and design**

To replicate our initial findings, we employed the same design as study 1. In contrast to study 1, however participants filled in self-rating questionnaires measuring charismatic leadership (Multifactor Leadership Questionnaire 5X-Short, Avolio & Bass, 2004; Conger-Kanungo scale, Conger, Kanungo, Menon, & Mathur, 1997), leader motivation (Motivation to Lead, affective identity, Chan & Drasgow, 2001), dominance (Kalma, Visser, & Peeters, 1993) and leader prototypicality (Antonakis et al., 2011). Furthermore, we collected audio-visual recordings of all participants' motivational speeches. These recordings were then presented to naïve observers (Antonakis et al., 2011), who assessed leaders' prototypicality (Antonakis et al., 2011), desirable leader attributes (first impressions, Oosterhof & Todorov, 2008) and leaders' charisma (Avolio & Bass, 2004). We further tested whether naïve observers were sensitive to interindividual variations in gaze behavior. To ensure that the eye contact perceived by observers reliably reflected their sensitivity towards a leader's gaze, we tested discriminant validity with regard to gestures and facial expressions.

## **Sample**

The initial sample for data analysis consisted of 75 healthy young adults (41 female; 34 male). Their age ranged from 18 to 32 years,  $M = 22.23$ ,  $SD = 2.79$ . Only two participants (male, 22; female, 21) recognized the video connection as being pre-recorded and were removed from analysis. Their data were not considered, resulting in a final sample of 73 (40 female; 33 male), whose age ranged from 18 to 32 years,  $M = 22.25$ ,  $SD = 2.83$ .

## Observers

Eight naïve observers (4 female; 4 male), with ages ranging between 19 and 31 (age:  $M = 22.50$ ,  $SD = 3.96$ ). Each rated the total 73 video recordings in a pseudo-randomized order (Antonakis et al., 2011). Further, the sensitivity of observers to differences in the nonverbal expressivity of the participants acting as leaders was assessed with four items, two for gaze behavior ("Holds eye contact", "Has a focused gaze") and one each for facial expressions ("Shows facial expressions") and gestures ("Uses gestures").

## Video recordings of participants

Audiovisual recordings were made of all participants for the length of the entire task using (Logitech HD-Webcam C920, 1920 x 1080 Pixel). Recordings were all made from the front, ensuring that observers could best identify when participants offered or tried to establish eye contact. For rating, only the first and last of the four speeches were used. The first was chosen because participants were then faced for the first time with motivating their followers, while the last was chosen due to our use of predefined feedback, which showed a decline in investments prior to the fourth round. This prompted participants to expend particular effort on their attempted motivation, to boost collective outcomes in the final round.

## Charisma

*Leaders' charisma.* We selected 16 items of the transformational leadership scale, specifically designed to capture a leader's charismatic aura and their emotional effect on followers (MLQ Form 5X-Short; Avolio & Bass, German translation by Felfe, 2006; Towler, 2003). An example item reads: "Impresses and fascinates others with his personality". Reliability for the selected items from the transformational leadership scale was measured at  $\alpha = .78$  for self-rating, and  $\alpha = .95$  for the naïve observers, with the ICC = .90.

*Charismatic leadership*. This was assessed using the Conger-Kanungo scale, which measures vision communication, as well as the daring and the personal and environmental sensitivity necessary to fulfil it (Conger & Kanungo, 1994). We employed the entire scale, which contained a total of 20 items, for example: "Shows sensitivity to the needs and feelings of other members in the organization." (Conger et al., 1997). Reliability was measured at  $\alpha = .84$ .

### **Leader Prototypicality**

*Leader Prototypicality* was assessed utilizing 3 items from the prototypicality questionnaire (Cronshaw & Lord, 1987; adapted by Antonakis et al., 2011). It measures the extent to which participants acting as leaders meet the observers' prototypical expectations of a leader. An example item being: "Person I am rating acts like a typical leader"<sup>2</sup>. Reliability was measured at  $\alpha = .80$  for self-rating, and  $\alpha = .95$  for the naïve observers, with an ICC = .89.

### **First impressions**

We measured different facets of first impressions from presented stimuli (Oosterhof & Todorov, 2008). We assessed five trait impressions, each of which was scored using one item. An example item being: "How charismatic is this person?", with the ICC = .84 (charisma); ICC = .80 (attractiveness); ICC = .77 (trustworthiness); ICC = .83 (dominance); ICC = .74 (intelligence).

### **Motivation to lead**

*Motivation to lead* was assessed using a questionnaire that measures personal preference and drive with respect to gaining a leadership position (affective identity, Chan & Drasgow, 2001). Motivation to lead was

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<sup>2</sup> We selected item from each scale with the highest corrected item total correlation.

measured using 9 items, an example item being: "I am the type of person who is not interested in leading others" (reversed). Reliability was measured at  $\alpha = .92$ .

## Dominance

*Dominance* is defined here as a strong motivation to realize one's own aims, even at the expense of personal relationships. It was measured using 20 items from an established questionnaire (Kalma et al., 1993), an example item being: "I like taking responsibility". Reliability was measured at  $\alpha = .76$ .

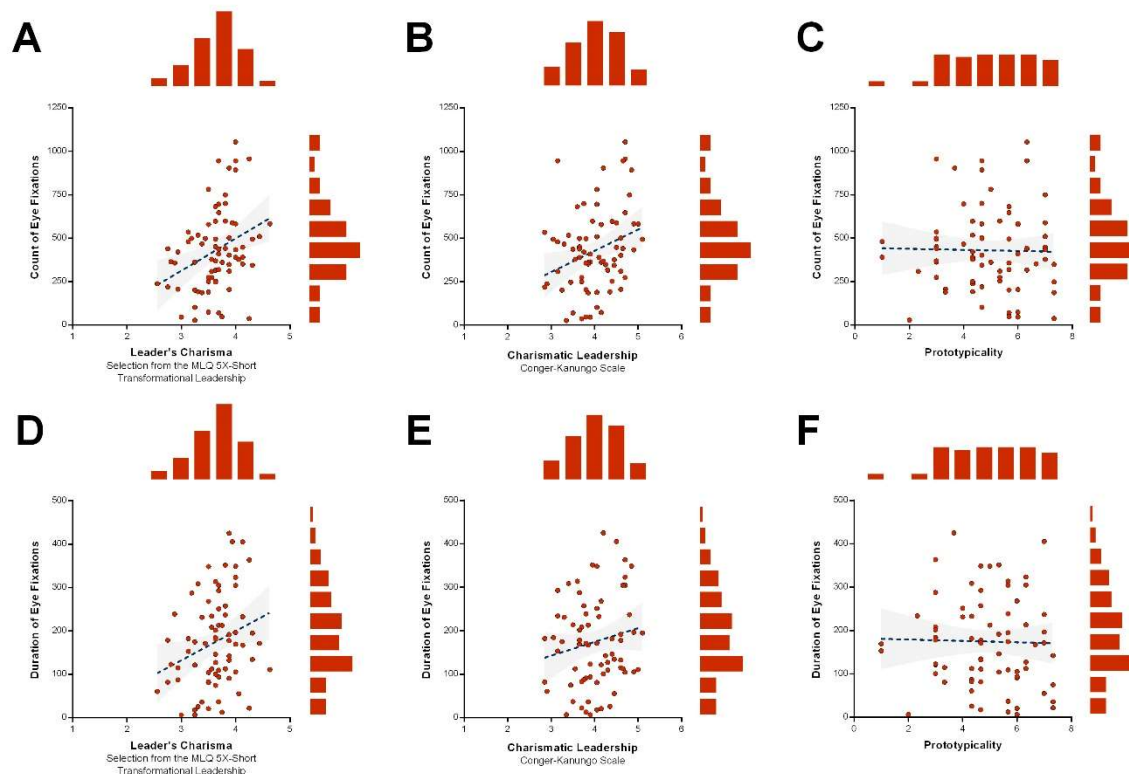
## Results and discussion

*Self-ratings.* We aimed to replicate the results gained in study 1, thereby consolidating evidence for hypotheses 1 and 2, and to connect gaze behavior to firmly established measures of charismatic leadership (see Table 3 and Fig. 3). Therefore, we performed correlational analyses between gaze behavior and the measurements of participants' perceptions of their own charisma. Firstly, leaders' charisma, as measured by a selection from the transformational leadership scale, showed an association with the count ( $r = .33, p = .0038$ ) and duration ( $r = .27, p = .0222$ ) of gaze fixations towards eye regions. Charismatic leadership was found to be associated with the count of fixations on eye regions ( $r = .29, p = .0128$ ), but not the duration of gaze ( $r = .17, p = .1602$ ).

These specific, consistent relationships between gaze and charisma contrast with leaders' assessments of their own dominance, found to have no relationship with either the duration or count of gaze fixations. Interestingly, leaders' judgements of their own leader prototypicality also showed no relationships with gaze, nor did their self-reported motivation to lead.

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Table 3 about here



**Fig. 3.** Correlations are displayed between the count (A-C) and duration (in [s]; D-F) of eye fixations and self-rated leaders' charisma (selection from the transformational leadership scale; A, D), charismatic leadership (Conger-Kanungo scale; B, E), and leader prototypicality (C, F). The unstandardized values are displayed with linear regressions and a 95% confidence interval. Histograms on either side of the graphs denote relative frequency distributions.  $N = 73$  for graphs A-J.

*Observer sensitivity towards gaze behavior.* We included several measures designed to assess the sensitivity of observers towards leaders' gaze behavior, specifically the count and duration of a leader's fixations towards the eyes of followers. Thereby, we ensured that the eye-directed gaze shown by leaders when attempting to influence followers was reliably transmitted through video recordings. Our results display a clear pattern of associations between the eye contact subjectively perceived by naïve observers, and that measured objectively by eye-tracking (count,  $r = .33$ ,  $p = .0039$ , duration,  $r = .39$ ,  $p = .0007$ ).

Interestingly, the extent to which observers rated a leader's gaze as focused was associated only with the duration of eye fixations ( $r = .30, p = .0090$ ), but not the count ( $r = .19, p = .1102$ ). This suggests that the quantifiable length of fixations towards the eyes of followers has a direct bearing on the subjectively ascribed intensity of eye contact as perceived by observers.

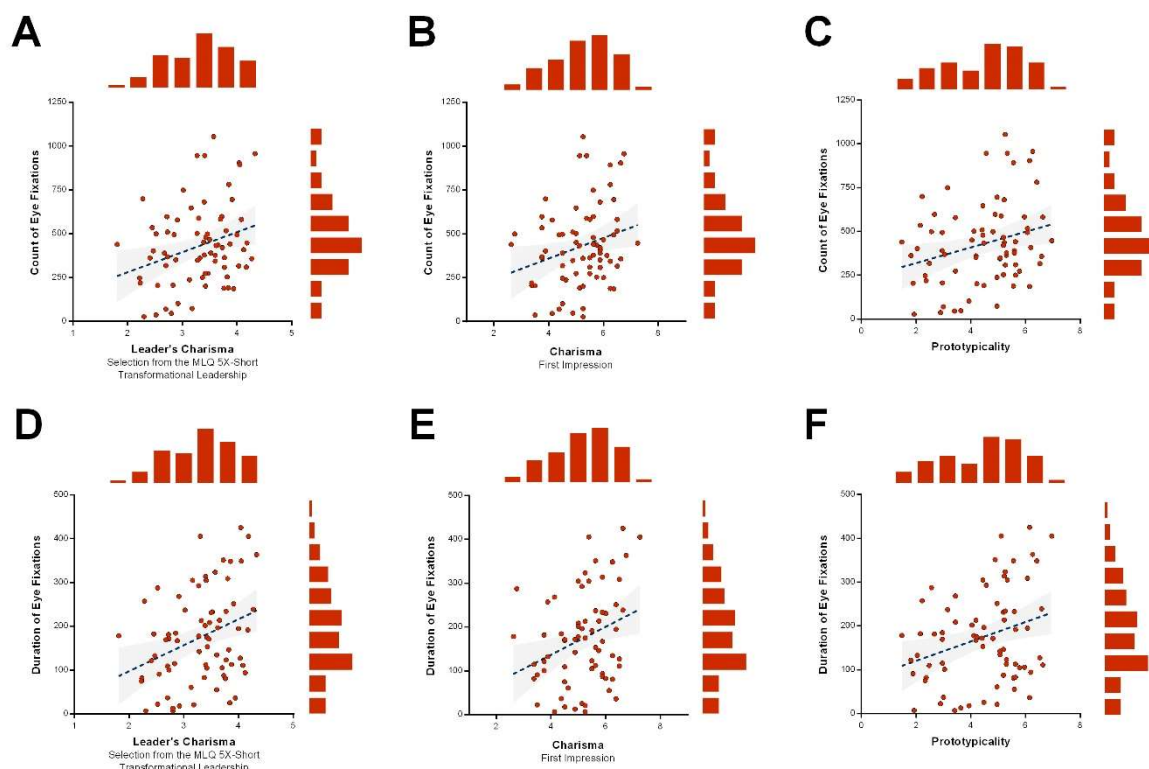
Discriminant validity was proven, as leaders' objectively assessed eye-directed gazing did not correlate with the ratings of facial expressiveness (count,  $r = .12, p = .3097$ ; duration,  $r = .17, p = .1591$ ) or with gesturing (count,  $r = .14, p = .2452$ ; duration,  $r = .13, p = .2798$ ). Therefore, observers did indeed appear sensitive to shifts in gaze behavior, which offers dual conclusions: firstly, that gaze towards the eyes of followers was indeed registered by the observers, and secondly, that higher levels of perceived eye contact were not distorted by increased perceptions of expressivity.

*Observer-ratings.* Leaders' charisma, captured by the selection from the transformational leadership scale, was found to correlate with both the count ( $r = .29, p = .0131$ ; see Table 4 and Fig. 4) and duration ( $r = .33, p = .0042$ ) of gaze fixations towards the eyes. Observers overall first impression of charisma reflected this with associations for both the count ( $r = .26, p = .0293$ ) and duration ( $r = .31, p = .0081$ ) of fixations to the eyes. Other first impressions of desirable leader attributes, also yielded results, with associations found between impressions of intelligence (count,  $r = .24, p = .0421$ ; duration,  $r = .34, p = .0036$ ) and of dominance (count,  $r = .26, p = .0247$ ; duration,  $r = .31, p = .0084$ ). First impressions of trustworthiness showed an association with only the duration ( $r = .30, p = .0100$ ) but not the count ( $r = .19, p = .1014$ ) of fixations towards the eyes, while attractiveness revealed no relationships.

Importantly, in contrast to leaders' own assessments of their leader prototypicality, observers' impressions were associated with both the count ( $r = .27, p = .0202$ ) and duration ( $r = .30, p = .0102$ ) of fixations towards the eyes.

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Table 4 about here





**Fig. 4.** Correlations are displayed between the count (A-C) and the duration (in [s]; D-F) of eye fixations and the naïve observers' ratings of leaders' charisma (selection from the transformational leadership scale; A, D), the first impression of charisma (B, E), and leader prototypicality (C, F). The unstandardized values ( $N = 73$ ) are displayed with linear regressions and a 95% confidence interval. Histograms on either side of the graphs denote relative frequency distributions.  $N = 73$ .

To conclude, our results reveal consistent links between a leader's charisma and their gaze towards the eyes of followers. More specifically, in a first step we found the frequency and duration of leaders' eye-directed gaze to be associated with perceptions of their own charisma, thereby providing additional support for hypotheses 1 and 2. Moreover, it was leaders' charisma in particular which was linked to gaze directed at

followers' eyes, with self-perceived measurements of related constructs such as dominance, motivation to lead and leader prototypicality failing to show any association.

In a second step, the results showed leaders' gaze to distinctly shape the social perception of an audience. A leader's gaze towards the eyes of followers was consistently associated with attributions of charisma made by naïve observers, hence providing support for hypotheses 3 and 4. Interestingly, the ascription of a series of desirable leader attributes by observers, and the overall judgement of a person as being a prototypical leader, were also influenced by leaders' gazing towards followers' eyes. This, crucially, lends support to evolutionary approaches to charisma, which assume charismatic behaviors to be indicative of leader ability as perceived by followership (Grabo et al., 2017).

## General discussion

Put yourself back into the situation of being in the audience of a product launch, when suddenly the gaze of the leader onstage hits you, and you feel captivated by their aura. It is this charismatic aura, constituted of a repertoire of signals, that enables outstanding leaders to exert influence over followers (Antonakis et al., 2016), to ameliorate group outcomes (Banks et al., 2017). However, the behaviors that constitute this phenomenon still remain elusive (van Knippenberg & Sitkin, 2013; Yukl, 1999). Aiming to add one missing piece to this puzzle, we mapped leaders' charisma onto one of the most basic nonverbal channels of communication, gaze behavior (Emery, 2000; Grossmann, 2017). Over two studies, we found consistent evidence endorsing the notion that, when leaders attempt to influence followers, both their own and others' ascriptions of their charisma are distinctly linked to the amount they gaze towards followers' eyes. More specifically, both studies showed individuals in leadership positions, who considered themselves to be more charismatic, to gaze more often (hypothesis 1) and for a longer time period towards followers' eyes (hypothesis 2). Results from study 2 further revealed that when participants in leadership positions sought more eye contact with followers, the former were perceived as more charismatic by their audience

(hypothesis 3 and 4). Beyond charisma, gaze is found to be instrumental in encouraging ascriptions of a range of attributes desirable to a leader, and in prompting the impression of a leader as prototypical for their station. Thus, these findings clearly indicate eye-directed gaze to be a component behavior of charisma, sent by leaders, received by followers, and utilized by the latter to shape their perceptions of a leader's charisma and prototypicality.

By shining the spotlight on one core element of leader signaling, the sending and receiving of a distinct behavior, we contribute to its elevation from an ill-defined gift to a repertoire of concrete behaviors (Antonakis et al., 2016; Van Knippenberg & Sitkin, 2013; Yukl, 1999). In the marketplace of leader selection, among other groups, followers gauge leaders' abilities, while leaders engage in signaling to appear as the most capable, with both striving for the most adaptive outcomes (Antonakis et al., 2016; Spence, 2002). However, leadership ability is not a directly observable quality, hence demanding that followers infer it from a leader's signals (Grabo et al., 2017). And indeed, more recently, leaders' charisma has been defined in this very way, to represent a selection of signals which enable leaders to influence followers (Antonakis et al., 2016). A charismatic leader's way of communicating, through both verbal and nonverbal behaviors, might therefore represent a repertoire of signals indicating desirable leader attributes to followers (Grabo et al., 2017; Reh et al., 2017; van Vugt & Grabo, 2015). For example, both being eloquent in debates, as well as the use of metaphors by leaders (e.g. Mio, Riggio, Levin, & Reese, 2005), act as reliable cues for cognitive sophistication (Silvia & Beaty, 2012; von Hippel, Ronay, Baker, Kjelsaas, Murphy, 2016), which is indeed related to leader effectiveness (e.g. Antonakis, House, & Simonton, 2017). The same holds true for nonverbal behavior, with charismatic leaders engaging in heightened and therefore energy-intensive nonverbal expressivity, which, possibly by indicating interest and excitement to followers, is a sound cue for leadership success (Tskhay et al., 2014).

Viewed through the lens of the signaling approach, our findings offer a glimpse into a core process of a charismatic leader's signaling, the sending and receiving of eye-directed gaze. A leader, directing their gaze towards the eyes of followers, spends their attentional resources on their followers, simultaneously suppressing other potentially relevant information from the environment. To followers, this may indicate

that a leader's attention is on them, and their message specifically directed towards them. Research does indeed show eye-directed gaze to act as a pointer (Kingstone, Tipper, Ristic, & Ngan, 2004), similar to calling somebody's name (Kampe et al., 2003), making it possible for a leader to tag followers, increasing their sense of self-involvement (e.g. Conty et al., 2016). This is a hallmark of the effect exuded by charismatic leaders, touching a follower's self, and making them susceptible to influence (Shamir, House, & Arthur, 1993; Howell & Shamir, 2005). It might be this very experience of feeling touched, feeling captivated, that makes a leader appear charismatic in the eyes of followers (Castelnovo, Popper, & Koren, 2017). Experiencing the aura of a leader's charisma might drive followers to perceive a leader as prototypical of their station (Antonakis et al., 2011; Cronshaw & Lord, 1987), helping the latter to win favor in the marketplace of leader selection (Grabo et al., 2017). Indeed, our results offer first partial evidence for this claim, by demonstrating that gaze directed towards followers' eyes is a behavior both expressed by charismatic leaders and received by their followers, and that it shapes the follower's perception of a leader as charismatic. In addition, by making a leader appear not merely more charismatic to their audience, but by inducing various ascriptions of desirable attributes, our findings suggest eye-directed gaze to shape receivers' impressions into the prototype of an outstanding leader: decisive, intelligent, trustworthy.

### **Future research directions and limitations**

In light of these findings, we suggest several avenues we consider fruitful, and discuss: first, how further research is needed to examine the outcomes gaze has for both leader and follower, before it can be confirmed as a signal of charisma; second, whether charismatic gaze is used in the service of communication, or merely for information gathering; thirdly, consider in how far leaders' eye-directed gaze is automatic or strategic, concluding with how instruction in strategic gaze could face and overcome certain inherent issues. Moreover, we devote the last conclusory section in enumerating the limitations we identify in our study and make suggestions for their remediation.

First, though this effect taps into the signaling process of charismatic leadership, signaling, as noted above, encompasses sending, receiving, and an adaptive outcome for both sender and receiver (Antonakis et al., 2016; Grabo et al., 2017; Spence, 2002). While our work demonstrates eye-directed gaze behavior to be both sent and received, it does not provide evidence for an adaptive outcome for leaders and followers. Interestingly, evidence reached from social cognition research indicates that beyond its impact on social perception, eye-directed gaze supports just such behaviors desirable in followership, those that are supportive of the leadership process. For example, looking at others can hijack their attention, might enable leaders to claim the spotlight of a group (Gerpott et al., 2018), and also help to form a social bond between the followers and their charismatic leader (e.g. Khalid et al., 2016). Most importantly, similar to a full display of charismatic leader behavior (Grabo & van Vugt, 2016), being looked at not only causes cooperative behaviors in a group to proliferate (e.g. Dear, Dutton, & Fox, 2019), but also enforces social pressures that ensure conformity (e.g. Panagopoulos & van der Linden, 2016). Therefore, beyond confirming that a leader's eye-directed gaze was received, further research is definitely needed to investigate how followers act upon it. An example would be better group performance in a coordination problem, achieved through cooperation, confirming the leader's effectiveness in his station (e.g. Grabo & van Vugt, 2016; Siposova, Tomasello, & Carpenter, 2018).

Second, our findings give rise to the question whether a leader's eye-directed gaze is driven by the need to gather information, or through its utility in impacting others. Without doubt, our eye behavior has the primary function of gathering visual information about our environment. Therefore, gazing at followers' eyes could reflect a mere need to collect the information they convey, as the eye region enables us to draw highly reliable inferences about where somebody's attention lies and what somebody actually feels (Emery, 2000). This alone might be valuable to charismatic leaders, allowing them to tune their persuasive efforts by the fine-grained reactions of followers. In contrast to such a pure information gathering account, a very recent line of research finds that in real social encounters, our gaze behavior is guided first and foremost by the affordances of the social situation, acting as a channel for communication (Risko et al., 2016). However, our findings do not allow us to draw conclusions about whether a leader's increased attention to

followers' eyes is due to information gathering or serves a communicative function. It is worth noting, however, that eye-directed gazing exerts its effects on receivers, irrespective of which function is dominant in directing gaze behavior.

Third, the question remains whether leaders show such eye behavior automatically or strategically. While there is a certain degree of control over gaze behavior (Laidlaw, Rothwell, & Kingstone, 2016), it is not always intentional, but operates first and foremost automatically, especially with regard to reflexively orienting towards the eyes of others (Thompson, Foulsham, Leekam, & Jones, 2019). It is worth noting that people have also been shown to exhibit more naturally occurring eye-contact when attempting to be persuasive (e.g. Mehrabian & Williams, 1969) or deceptive (e.g. Riggio & Friedman, 1983). Similarly, people holding high status or expertise gaze more towards their counterparts while speaking, and less when listening (e.g. Dovidio & Ellyson, 1985; Koch, Baehne, Kruse, Zimmermann, & Zumbach, 2010). These findings support the notion that heightened eye-directed gaze is employed whenever the aim is to influence an audience. While none of these studies, including our own, permit conclusions about whether this critical gaze behavior is reflexive or controlled, there do exist multiple findings indicating that we automatically orient our gaze towards relevant cues (e.g. Preciado, Munneke, & Theeuwes, 2017). Therefore, we argue that participants placed in a leadership position gazed towards the eyes of followers automatically, rather than intentionally (e.g. Risko, Anderson, Lanthier, & Kingstone, 2012). Hence, it would be premature to draw conclusions on how followers perceive leaders' eye directed gazing, were leaders to engage in eye-directed gazing in a controlled, intentional manner rather than genuinely. For example, staring that appears unnaturally fixed, or too much eye-directed gaze, could certainly tip perception of the leader from authentic to artificial, or even provocative (e.g. Giacomantonio, Jordan, Federico, van den Assem, & van Dolder, 2018). Indeed, it is well-known that certain factors can be beneficial to overall leader effectivity, and yet turn detrimental when overdone (e.g. Antonakis et al., 2017). Hence, conflicting or distorting factors (Spisak, Grabo, Arvey, & van Vugt, 2014), such as a "too-much" effect, are an issue which require their own research before any consideration of leader instruction aimed at altering gaze behavior (e.g. Frese, Beimel, & Schoenborn, 2003; Towler, 2003).

Even though our results offer consistent evidence linking eye-directed gaze and leaders' charisma, there are some limitations to our findings. Most importantly, we followed an appeal to conduct more controlled studies on leaders' charisma with high internal validity (Antonakis et al., 2016), but in doing so we face inherent limitations with respect to the ecological validity of the task. First, as we aimed to capture interindividual differences in genuine eye-directed gaze, some restraints to the natural flow of conversation were inevitable. Future studies should aim to replicate our findings in more unrestricted conditions, such as using mobile eye-tracking during a natural conversation between a leader and their followers, which would void the necessity of simulating interactions to participants (e.g. Rogers, Speelman, Guidetti, & Longmuir, 2018). Second, we examined one component behavior of charisma, yet others are likely of equal importance when charismatically influencing others. It might be interesting to investigate how tonality, facial expressions, or gestures affect followers' perceptions of their leader (Antonakis et al., 2011; Sy, Horton, & Riggio, 2018; van Knippenberg & van Kleef, 2016). Third, there are differences between cultures in the way eye-directed gaze is shown, and in how it is utilized by receivers to inform their interpersonal judgments. For example, members of Eastern cultures are found to hold eye contact less than those of Western cultures (McCarthy, Lee, Itakura, & Muir, 2006), and are similarly more likely to perceive those who gaze intently at them as angry, unapproachable or unpleasant, compared to members of Western cultures (Akechi et al., 2013). However, it is worth noting that cultural effects are largely restricted to emotional perception, and there is a lack of evidence for effects on other impressions or physiological responses (Akechi et al., 2013). Hence, cultural norms and display rules may act as a factor leveraging potency, possibly dampening the relationship between a leaders' eye directed gaze and followers' perceptions of their charisma.

## Conclusion

646 Charismatic leaders are outstanding at captivating their audiences, and thus excel at influencing them to  
647 share their vision of the future. However, it remains elusive what leader behaviors induce this charm, incite  
648 a followership and inspire shared visions with such potency (Yukl, 1999). These findings provide the first  
649 evidence that a leader's gaze, when directed towards the eyes of followers and received by the latter, makes  
650 that leader appear more charismatic, and as the prototypical ideal of their role. By mapping charisma onto  
651 gaze behavior, our studies add to this picture by taking a first step towards turning this distal construct right  
652 side up, and positioning it on firm, behavioral underpinnings (Antonakis et al., 2016).



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**Table 1**

Means, standard deviations, and Pearson product-moment correlations among the two measures of eye-directed gazing and the self-rated variables charisma influence, charisma affability, and the five factors of personality.

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age	21.08	2.19											
2. Gender <sup>a</sup>	.74	.44	-.16										
3. Count of eye fixations	482.84	269.09	-.01	.01									
4. Duration of eye fixations [s]	185.89	106.17	-.08	-.06	.85 ***								
5. Charisma influence	3.11	.83	-.04	-.25 *	.33 **	.29 **	(.89)						
6. Charisma affability	3.94	.63	-.13	.12	.20	.14	.42 ***	(.75)					
7. Neuroticism	2.82	.77	-.18	.29 **	-.06	-.08	-.37 ***	-.43 ***	(.89)				
8. Extraversion	3.22	.58	.00	.06	.19	.17	.52 ***	.56 ***	-.58 ***	(.80)			
9. Openness	3.88	.52	-.12	-.04	-.12	-.10	.08	.22	-.01	-.01	(.74)		
10. Agreeableness	3.86	.49	-.13	.21	.15	.13	-.26 *	.34 **	-.22 *	.21	-.05	(.76)	
11. Conscientiousness	3.53	.54	.01	.08	.14	.04	.24 *	.30 **	-.32 **	.15	.02	.13	(.80)

*Note.* *N* = 80. Reliabilities are presented along the diagonal in parentheses.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

<sup>a</sup> Dummy variable (0 = male, 1 = female)

**Table 2**

Results of the regression analyses, assessing the additional variance in the amount and duration of eye fixations explained by the inclusion of both charisma subscales, influence and affability (Model 2), to the model containing the five factors of personality (Big 5; Model 1).

Variables	Count of eye fixations		Duration of eye fixations	
	Model 1	Model 2	Model 1	Model 2
Neuroticism	.15 (.16)	.19 (.16)	.05 (.16)	.10 (.16)
Extraversion	.23 (.15)	-.02 (.17)	.18 (.15)	-.05 (.16)
Openness	-.11 (.14)	-.13 (.14)	-.09 (.14)	-.10 (.14)
Agreeableness	.11 (.11)	.32* (.12)	.10 (.11)	.31* (.13)
Conscientiousness	.14 (.12)	.05 (.12)	.01 (.12)	-.06 (.12)
Charisma influence		.50** (.15)		.48** (.15)
Charisma affability		-.01 (.13)		-.06 (.14)
$R^2$	.08	.22	.05	.16
$F$ -Statistic	$F(5,74) = 1.34$	$F(7,72) = 3.47^{**}$	$F(5,74) = .70$	$F(7,72) = 2.30^*$

Note.  $N = 80$ . Standardized coefficients are reported.

Robust standard errors (HC3) are displayed below the estimates in parentheses.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Table 3**

Means, standard deviations, and Pearson product-moment correlations among the two measures of eye-directed gazing and the self-rated variables prototypicality, leader's charisma (selection from transformational leadership scale), the Conger-Kanungo scale (C-K Scale), affective identity motivation to lead (Affective MTL), and dominance.

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Age	22.25	2.83									
2. Gender <sup>a</sup>	.55	.50	-.14								
3. Count of eye fixations	429.07	234.45	.18	.06							
4. Duration of eye fixations [s]	174.72	106.04	.15	.00	.81 ***						
5. Leader's charisma	3.63	.42	.16	-.17	.33 **	.27 *	(.78)				
6. C-K Scale	4.01	.56	.14	-.10	.29 *	.17	.56 ***	(.84)			
7. Prototypicality	4.91	1.53	-.20	-.30 **	-.02	-.02	.38 **	.37 **	(.80)		
8. Affective MTL	3.00	.88	-.05	-.09	-.02	-.03	.31 **	.33 **	.72 ***	(.92)	
9. Dominance	3.61	.58	-.10	-.33 **	.03	-.03	.42 ***	.39 ***	.62 ***	.61 ***	(.76)

Note. *N* = 73. Reliabilities are presented along the diagonal in parentheses.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

<sup>a</sup> Dummy variable (0 = male, 1 = female)



**Table 4**

Means, standard deviations, and Pearson product-moment correlations among the two measures of eye-directed gazing and the observer-rated variables prototypicality, leaders' charisma (selection from transformational leadership scale), the five first impression measures (7.-11.), and the four measures of observer's sensitivity (12.-15.).

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Age	22.25	2.83														
2. Gender <sup>a</sup>	.55	.50	-.14													
3. Count of eye fixations	429.07	234.45	.18	.06												
4. Duration of eye fixations [s]	174.72	106.04	.15	.00	.81 ***											
5. Leader's charisma	3.30	.59	.34 **	-.09	.29 *	.33 **	(.95)									
6. Prototypicality	4.46	1.43	.32 **	-.21	.27 *	.30 *	.92 ***	(.95)								
7. Charismatic	5.19	1.02	.30 **	-.23	.26 *	.31 **	.87 ***	.88 ***								
8. Intelligent	5.90	.70	.22	-.01	.24 *	.34 **	.82 ***	.81 ***	.75 ***							
9. Dominant	4.60	1.20	.27 *	-.29 *	.26 *	.31 **	.72 ***	.84 ***	.81 **	.68 ***						
10. Trustworthy	5.80	.90	.23 *	.03	.19	.30 **	.79 ***	.71 ***	.70 ***	.82 ***	.48 ***					
11. Attractive	5.16	.98	-.15	.01	.02	.09	.27 *	.30 *	.41 ***	.43 ***	.32 **	.35 *				
12. Eye Gaze (eye contact)	3.63	.50	.12	-.15	.33 **	.39 ***	.69 ***	.74 ***	.68 ***	.63 ***	.74 ***	.47 ***	.44 ***			
13. Eye Gaze (focus)	3.04	.49	.16	-.25 *	.19	.30 **	.65 ***	.74 ***	.64 ***	.60 ***	.74 ***	.42 ***	.42 ***	.88 ***		
14. Facial Expression (strong)	2.58	.70	.21	.19	.12	.17	.55 **	.41 ***	.58 ***	.40 ***	.32 **	.42 ***	.30 *	.29 *	.20	
15. Gestures (strong)	1.71	.72	.37 **	.01	.14	.13	.44 **	.31 **	.39 ***	.27 *	.29 *	.25 *	-.09	.18	.08	.52 ***

Note. *N* = 73 participants; *N* = 584 ratings. Reliabilities are presented along the diagonal in parentheses.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

<sup>a</sup> Dummy variable (0 = male, 1 = female)